

CLAIMS

1. Optical amplifying materials consisting of a support, having coated thereon an amplifying layer and a luminescence layer above this layer, wherein the amplifying layer contains nanocrystalline, nanoporous aluminum oxide and/or aluminum oxide/hydroxide.
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2. Optical amplifying materials according to claim 1, wherein said amplifying layer contains the nanocrystalline, nanoporous aluminum oxide and/or aluminum oxide/hydroxide in a quantity from 0.1 g/m² to 20 g/m².
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3. Optical amplifying materials according to claim 1, wherein said amplifying layer contains the nanocrystalline, nanoporous aluminum oxide and/or aluminum oxide/hydroxide in a quantity from 1 g/m² to 10 g/m².
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4. Optical amplifying materials according to claim 1, wherein said nanocrystalline, nanoporous aluminum oxide and/or aluminum oxide/hydroxide in the amplifying layer comprises one or more of the elements of the periodic system of the elements with atomic numbers 57 to 71 in an amount of from 0.2 to 2.5 mole percent relative to Al₂O₃.
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5. Optical amplifying materials according to claim 1, wherein that said amplifying layer contains up to 10 % of a binder relative to the quantity of the nanocrystalline, nanoporous aluminum oxide and/or aluminum oxide/hydroxide.
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6. Optical amplifying materials according to claim 5, wherein the binder is film forming.
- 30 7. Optical amplifying materials according to claim 6, characterized in that the binder is polyvinyl alcohol.
- 35 8. Optical amplifying materials according to claim 1, wherein said amplifying layer contains up to 5 % of a binder relative to the quantity of the nanocrystalline, nanoporous aluminum oxide and/or aluminum oxide/hydroxide.

9. Optical amplifying materials according to claim 8, wherein the binder is film forming.
- 5 10. Optical amplifying materials according to claim 9, wherein the binder is poly-vinyl alcohol.
11. Optical amplifying materials according to claim 1, wherein the luminescence layer consists of tris(8-hydroxyquinoline) aluminum.
- 10 12. Optical amplifying materials according to claim 11, wherein the luminescence layer consists of the crystal modification of tris(8-hydroxyquinoline) aluminum showing green luminescence.
- 15 13. Optical amplifying materials according to claim 12, wherein the crystal modification of tris(8-hydroxyquinoline) aluminum showing green luminescence in the luminescence layer is transformed to the crystal modification showing blue luminescence by illumination at room temperature in the presence of air with daylight.
- 20 14. Optical amplifying materials according to claim 1, wherein the support is coated or uncoated paper, plastic film or glass.
- 25 15. Support with an amplifying layer consisting of nanocrystalline, nanoporous aluminum oxide and/or aluminum oxide/hydroxide, optionally comprising one or more of the elements of the periodic system of the elements with atomic numbers 57 to 71 in an amount of from 0.2 to 2.5 mole percent relative to Al_2O_3 , and, optionally, a binder, coated onto the support, as substrate whereon a luminescence layer may be deposited.